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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/627,522	07/28/2000	M. Eric Taylor	510553.90940	3922

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EXAMINER

DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 01/16/2003

23

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/627,522

Applicant(s)

Taylor et al.

Examiner

Tracy Dove

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Nov 12, 2002
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-71 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 21 6) ☐ Other:

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DETAILED ACTION

This Office Action is in response to the communication filed on 11/12/02. Applicant's arguments have been considered, but are not persuasive. Claims 30-71 are pending and have been rejected in view of the prior art. Claims 1-29 have been canceled. This Action is made **FINAL**, as necessitated by amendment.

Double Patenting

The double patenting rejection has been withdrawn. A proper terminal disclaimer was filed on 11/12/02.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 62 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 62 recites "silver is in an amount of greater than about 0 to 0.015%", which is indefinite. The use of the phrase "greater than about" is unclear. Examiner suggests the claim be amended to state "greater than 0".

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Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 30-38, 40-52, 54-56 and 71 are rejected under 35 U.S.C. 102(e) as being anticipated by, and alternatively under 35 U.S.C. 103(a) as being unpatentable over, Rao et al., US 5,874,186.

Rao discloses lead-acid batteries having grids made from calcium-tin-silver lead-based alloys in which the alloy composition is carefully selected based upon the grid manufacturing technique of choice and the battery service application. Thus, for such directly cast strip positive grids, it has been found that alloys of the following composition, based upon the total weight of the fabricated grid, are suitable: about 0.030 to 0.050% calcium, from about 0.65 to 1.25% tin, from about 0.018 to 0.030% silver, and the remainder lead (see abstract). Aluminum can be optionally included in an amount from about 0.004 to about 0.01% (col. 9, lines 54-57). Alternatively for gravity casting of the grid, the alloy composition of the grid is: 0.035 to 0.055% calcium, about 0.95 to about 1.45% tin, about 0.018 to about 0.030 silver, and the remainder lead, all the percentages being based upon the total weight of the grid. Rao teaches many alternative compositions for the lead-based alloy grid depending on the technique which is used to manufacture the grid. See col. 9, line 45 through col. 10, line 8. The use of the grid in sealed and maintenance free batteries is taught. When the battery grids are made by continuous strip casting the lead based alloy is: calcium in the range of from 0.030 to 0.050%, tin in the range of from 0.95 to 1.25% and silver in the range of from 0.017 to 0.030% (see abstract).

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The battery of Rao includes a container, a plurality of electrodes and a plurality of separators. The electrode includes a supporting grid structure having a layer of active material pasted thereto. See col. 11, lines 7-23 and Figs 1 and 2.

Thus the claims are anticipated.

The claims are alternatively unpatentable under 35 U.S.C. 103(a) because while Rao '186 does not have a specific teaching within the claimed range of instant claims 30 and 44, unduly high silver levels may cause brittleness in the cast strip of the grid structure (see col. 16, lines 35-37). Rao further teaches that to the extent possible, the silver content should be minimized to reduce any effect on the oxygen overvoltage at the positive electrode of the lead acid cell (see col. 18, lines 15-19). Furthermore, Rao teaches the combination of the silver and tin ranges should be coordinated to reduce the susceptibility of the directly cast strip to hot-cracks and hot-tear type defects (col. 16, lines 32-35). Thus, one of skill would be motivated to modify the silver and tin ranges to reduce the susceptibility of the directly cast strip to hot-cracks. One of skill would be motivated to minimize the silver contained in the lead alloy to reduce any effect on the oxygen overvoltage at the positive electrode and to minimize brittleness in the cast strip.

Note MPEP 2131.03 states:

A 35 U.S.C. 102 /103 combination rejection is permitted if it is unclear if the reference teaches the range with "sufficient specificity." The examiner must, in this case, provide reasons for anticipation as well as a motivational statement regarding obviousness. Ex parte Lee 31 USPQ2d 1105 (Bd. Pat. App. & Inter. 1993) (expanded Board).

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Note the instant claims and the Rao patent use language such as “about” to describe and claim the ranges of calcium, tin and silver in the lead-based alloy. Claim language such as “about” is interpreted broadly when applying prior art.

Claims 30-71 are rejected under 35 U.S.C. 102(b) as being anticipated by, and alternatively under 35 U.S.C. 103(a) as being unpatentable over, Rao et al., US 5,691,087, as evidenced by Rao et al., US 5,874,186.

Rao teaches a sealed lead-acid cell or battery having positive plates made from an alloy of lead, from about 0.025 to about 0.06% calcium, from about 0.3 to about 0.9% tin and from about 0.015 to about 0.045% silver. See abstract. Rao discloses manufacturing the grids by gravity casting and adding aluminum to the lead alloy in an amount of from about 0.008 to about 0.0120%, however up to 0.03% of aluminum may be used. See col. 8, lines 13-29. Figure 7 shows a lead-acid cell having a container 92 containing a plurality of positive and negative plates 94,96. The plates are separated by absorbent separators 98. Figure 6 shows the positive plate has a grid supporting structure 80 containing an active material. See col. 18, line 66- col. 19, line 30. In general, the tin content employed in the lead-based alloy will be in the range of 12-18 times that of the calcium content (col. 10, lines 20-22). Figure 1 shows a maintenance-free battery. Claim 1 recites a sealed cell. Rao teaches the disclosed lead-acid battery is used in an automobile (col. 9).

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Regarding claims 32, 38, 46, 52, 64 and 66, Rao teaches the ratio of tin to calcium may be 20:1 or greater. The calcium content of the lead alloy may range from 0.025-0.06%, while the tin content of the alloy may range from 0.3-0.9% (abstract). Thus, if the calcium content is 0.025% the tin content would be 0.5-0.9% of the lead alloy to provide a tin to calcium ratio not less than 20:1. If the tin content is 0.9% of the lead alloy, the calcium content may be 0.025-0.045% to provide a tin to calcium ratio of not less than 20:1.

Thus the claims are anticipated.

The claims are alternatively unpatentable under 35 U.S.C. 103(a) because while Rao '087 does not have a specific teaching within the claimed range of instant claims 30, 44 and/or 57, unduly high silver levels may cause brittleness in the cast strip of the grid structure (evidenced by Rao '186, col. 16, lines 35-37). Rao '186 further teaches that to the extent possible, the silver content should be minimized to reduce any effect on the oxygen overvoltage at the positive electrode of the lead acid cell (see col. 18, lines 15-19). Furthermore, Rao '186 teaches the combination of the silver and tin ranges should be coordinated to reduce the susceptibility of the directly cast strip to hot-cracks and hot-tear type defects (col. 16, lines 32-35). Thus, one of skill would be motivated to modify the silver and tin ranges of Rao '087 to reduce the susceptibility of the directly cast strip to hot-cracks. One of skill would be motivated to minimize the silver contained in the lead alloy of Rao '087 to reduce any effect on the oxygen overvoltage at the positive electrode and to minimize brittleness in the cast strip. This is evidenced by Rao '186.

Note MPEP 2131.03 states:

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A 35 U.S.C. 102 /103 combination rejection is permitted if it is unclear if the reference teaches the range with "sufficient specificity." The examiner must, in this case, provide reasons for anticipation as well as a motivational statement regarding obviousness. Ex parte Lee 31 USPQ2d 1105 (Bd. Pat. App. & Inter. 1993) (expanded Board).

Note the instant claims and the Rao patent use language such as "about" to describe and claim the ranges of calcium, tin and silver in the lead-based alloy. Claim language such as "about" is interpreted broadly when applying prior art.

Response to Arguments

Applicant's arguments filed 11/12/02 have been fully considered but they are not persuasive.

35 U.S.C. 112, second paragraph

Applicant has amended claim 63 to recite "silver is in an amount of greater than about 0 to 0.015%", and asserts this was prescribed by the Examiner. The Examiner never suggested the indefinite language "greater than about".

The 35 U.S.C. 112, second paragraph, rejection of claims 70 and 71 has been withdrawn.

RAO et al., US 5,874,186

Applicant argues the combination of elements recited in independent claims 30 and 44 are not identically disclosed by Rao et al. '186 under 35 U.S.C. 102(e). Specifically, the grid supporting structure of claims 30 and 44 comprising a lead-based alloy having tin of about 0.8%

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to about 1.1%, silver less than 0.02% (and greater than zero), and calcium in an amount such that the ratio of tin to calcium is greater than about 12:1 is not identically disclosed by Rao et al. '186.

Examiner disagrees with Applicant's analysis of the Rao reference. Specifically, Rao does teach the grid supporting structure comprising the recited lead-based alloy of claims 30 and 44. Rao discloses lead-acid batteries having grids made from calcium-tin-silver lead-based alloys in which the alloy composition is carefully selected based upon the grid manufacturing technique of choice and the battery service application. Rao teaches the following alloy compositions:

1. about 0.030 to 0.050% calcium, from about 0.65 to 1.25% tin, from about 0.018 to 0.030% silver, and the remainder lead;
2. 0.035 to 0.055% calcium, about 0.95 to about 1.45% tin, about 0.018 to about 0.030 silver, and the remainder lead; and,
3. calcium in the range of from 0.030 to 0.050%, tin in the range of from 0.95 to 1.25% and silver in the range of from 0.017 to 0.030%, and the remainder lead.

Rao teaches many alternative compositions for the lead-based alloy grid depending on the technique which is used to manufacture the grid.

Applicant argues Rao 5,874,186 does not disclose the subject matter recited in claims 30 and 44 with sufficient specificity and asserts that the suggestion to make the modification has been taken from the applicant's own specification. However, the MPEP allows for a 35 U.S.C. 102 /103 combination rejection if it is unclear if the reference teaches the range with "sufficient

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specificity.” The examiner has provided reasons for anticipation as well as a motivational statement regarding obviousness (see above). Applicant’s assertion that the motivation was taken by the Examiner from Applicant’s own disclosure is without basis. The Examiner has clearly pointed out that the motivation came from the Rao et al. ‘186 reference. Rao ‘186 discloses unduly high silver levels may cause brittleness in the cast strip of the grid structure (see col. 16, lines 35-37). Rao further teaches that to the extent possible, the silver content should be minimized to reduce any effect on the oxygen overvoltage at the positive electrode of the lead acid cell (see col. 18, lines 15-19). Furthermore, Rao teaches the combination of the silver and tin ranges should be coordinated to reduce the susceptibility of the directly cast strip to hot-cracks and hot-tear type defects (col. 16, lines 32-35). Thus, one of skill would be motivated to modify the silver and tin ranges to reduce the susceptibility of the directly cast strip to hot-cracks. One of skill would be motivated to minimize the silver contained in the lead alloy to reduce any effect on the oxygen overvoltage at the positive electrode and to minimize brittleness in the cast strip. It is unclear how Applicant can assert “no suggestion or motivation to make the cited modification is present in Rao et al., ‘186” (page 7 of the amendment), when the Examiner has clearly pointed out the sections of Rao ‘186 that suggest the modification. Note Applicant has not addressed the motivational statement provided by the Examiner.

Applicant argues that there is no identification or recognition in Rao ‘186 of the beneficial effect and unexpected decrease in the cracking as identified by the Applicants in a combination including, among other elements, an alloy having the range of silver and tin as

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recited in claims 30 and 44. However, Rao has a clear teaching that the ranges of silver and tin are important to reduce the susceptibility of the directly cast strip to hot-cracks and hot-tear type defects, col. 16, lines 32-35 (Applicant's asserted "unexpected result"). Note the specification provides clear evidence of unexpected results on page 19 for a *silver range of 0.0030-0.0124%* (outside the range of Rao) based on the total weight of the lead-based alloy. However, the claims (i.e., claims 30 & 44) are not limited to the range of silver in the lead-based alloy that produces the unexpected result of no grid cracking.

Examiner points out that Rao discloses a lead-based grid alloy having from about 0.018-0.030% silver. Furthermore, the abstract of Rao teaches a lead-based alloy having silver in the range of from 0.017 to 0.030%. Thus, for the range of silver contained in the claimed grid alloy 0.017-0.02% silver is anticipated by Rao. Evidence of unexpected results cannot overcome a 35 U.S.C. 102 rejection (anticipation rejection).

RAO et al., US 5,691,087

Applicant argues the combination of elements recited in independent claims 30, 44 and 57 are not identically disclosed by Rao et al. '087 under 35 U.S.C. 102(b). Specifically, the grid supporting structure of claims 30 and 44 or the plate of claim 57 comprising a lead-based alloy having tin of about 0.8% to about 1.1%, silver less than 0.02% (and greater than zero) or less than 0.015% (claim 57), and calcium in an amount such that the ratio of tin to calcium is greater than about 12:1 is not identically disclosed by Rao et al. '087.

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Examiner disagrees with Applicant's analysis of the Rao '087 reference. Specifically, Rao '087 does teach the grid supporting structure comprising the recited lead-based alloy of claims 30, 44 and 57. Rao '087 teaches a sealed lead-acid cell or battery having positive plates made from an alloy of lead, from about 0.025 to about 0.06% calcium, from about 0.3 to about 0.9% tin and from about 0.015 to about 0.045% silver (see abstract). Rao '087 discloses the tin content employed in the lead-based alloy will be in the range of 12-18 times that of the calcium content (col. 10, lines 20-22).

Applicant argues Rao 5,691,087 does not disclose the subject matter recited in claims 30, 44 and 57 with sufficient specificity and asserts that the suggestion to make the modification has been taken from the applicant's own specification. However, the MPEP allows for a 35 U.S.C. 102 /103 combination rejection if it is unclear if the reference teaches the range with "sufficient specificity." The examiner has provided reasons for anticipation as well as a motivational statement regarding obviousness (see above). Applicant's assertion that the motivation was taken by the Examiner from Applicant's own disclosure is without basis. The Examiner has clearly pointed out that the motivation came from the Rao et al. '186 reference. Rao '186 discloses unduly high silver levels may cause brittleness in the cast strip of the grid structure (see col. 16, lines 35-37). Rao '186 further teaches that to the extent possible, the silver content should be minimized to reduce any effect on the oxygen overvoltage at the positive electrode of the lead acid cell (see col. 18, lines 15-19). Furthermore, Rao '186 teaches the combination of the silver and tin ranges should be coordinated to reduce the susceptibility of the directly cast

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strip to hot-cracks and hot-tear type defects (col. 16, lines 32-35). Thus, one of skill would be motivated to modify the silver and tin ranges to reduce the susceptibility of the directly cast strip to hot-cracks. One of skill would be motivated to minimize the silver contained in the lead alloy to reduce any effect on the oxygen overvoltage at the positive electrode and to minimize brittleness in the cast strip. Note Applicant has not addressed the motivational statement provided by the Examiner.

Applicant argues that there is no identification or recognition in Rao '087 or Rao '186 of the beneficial effect and unexpected decrease in the cracking as identified by the Applicants in a combination including, among other elements, an alloy having the range of silver and tin as recited in claims 30, 44 and 57. However, Rao '186 has a clear teaching that the ranges of silver and tin are important to reduce the susceptibility of the directly cast strip to hot-cracks and hot-tear type defects, col. 16, lines 32-35 (Applicant's asserted "unexpected result"). Note the specification provides clear evidence of unexpected results on page 19 for a *silver range of 0.0030-0.0124%* (outside the range of both Rao '087 and Rao '186) based on the total weight of the lead-based alloy. However, the claims (i.e., claims 30, 44 & 57) are not limited to the range of silver in the lead-based alloy that produces the unexpected result of no grid cracking.

Examiner points out that Rao '087 discloses a lead-based grid alloy having from about 0.015-0.045% silver. Thus, for the range of silver contained in the claimed grid alloy 0.015-0.02% silver is anticipated by Rao '087. Evidence of unexpected results cannot overcome a 35 U.S.C. 102 rejection (anticipation rejection).

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Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is (703) 308-8821. The Examiner may normally be reached Monday-Thursday (9:00 AM-7:30 PM). My supervisor is Pat Ryan, who can be reached at (703) 308-2383. The Art Unit receptionist can be reached at (703) 308-0661 and the official fax numbers are 703-872-9310 (after non-final) and 703-872-9311 (after final).

January 13, 2003


Patrick Ryan
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